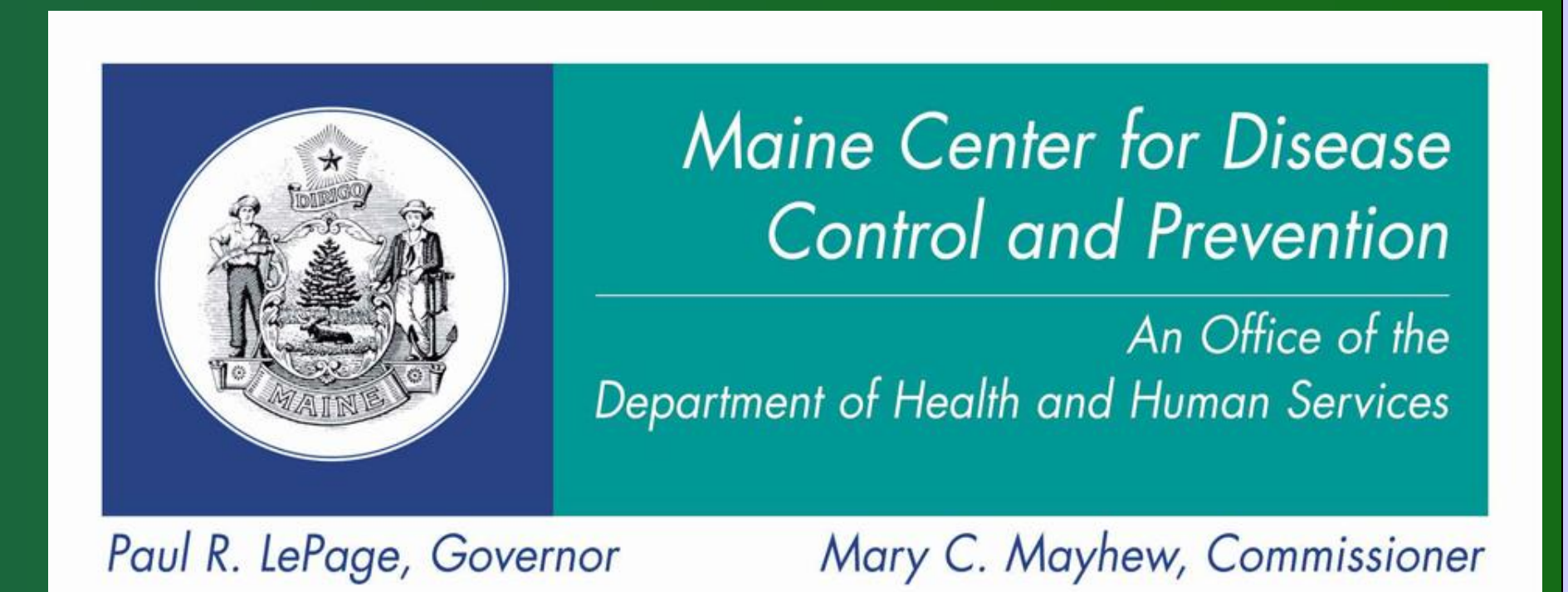


# Validating Electronic Laboratory Reports of Notifiable Diseases from a National Laboratory – Maine, 2012-2013

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## BACKGROUND

The Maine Center for Disease Control and Prevention (Maine CDC) is working with laboratories across the state, and the nation, to implement electronic laboratory reporting (ELR) of notifiable conditions.

ELR is the direct, automated messaging of reportable disease laboratory information from clinical laboratory information management systems (LIMS) directly to the appropriate public health jurisdiction's disease surveillance system.

Maine CDC uses the federal CDC-developed NEDSS base system (NBS) for its disease surveillance and, traditionally, these paper reports are manually keyed into NBS.

The goal is to move away from the traditional methods of disease reporting (fax, mail, and phone) and rely exclusively on electronic laboratory reporting.

To reach this goal, Maine CDC works with each laboratory to ensure that electronic laboratory reports sent to Maine CDC are complete, accurate, and timely.

## PURPOSE

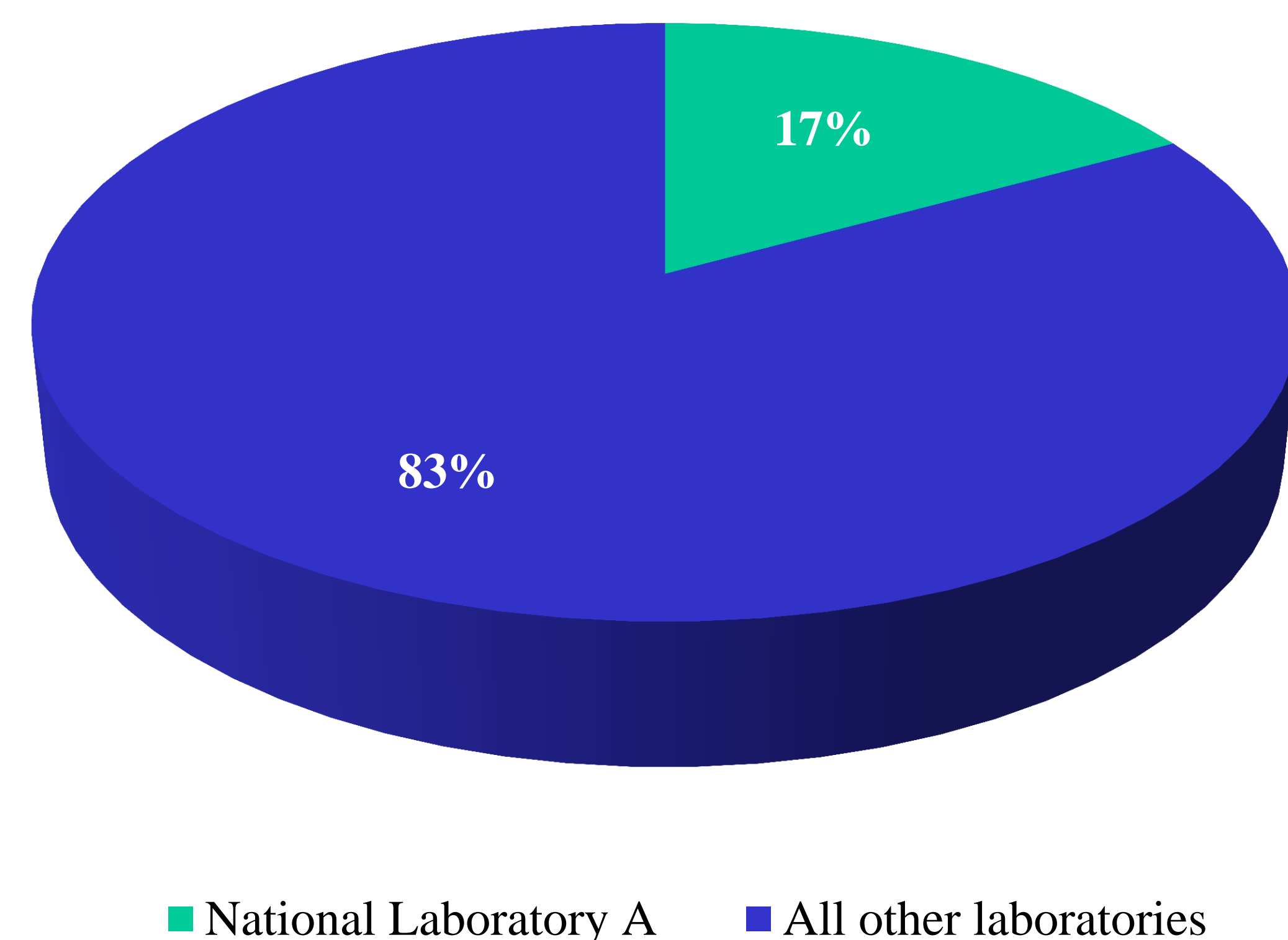
ELR minimizes the human effort required to report cases and improves completeness, accuracy, and timeliness. For our purposes:

- "Completeness" - whether or not data is missing
- "Accuracy" - the quality of the data received
- "Timeliness" - how quickly the result is reported

The ultimate goal is for labs to report all notifiable conditions electronically and discontinue traditional reporting.

National reference laboratories can have a high volume of reporting. Therefore, it is preferable to target these laboratories, connect to them electronically, and validate the reports. We will focus on a single national reference laboratory, National Laboratory A, which accounts for 17% of the total report volume to Maine CDC (Figure 1).

Figure 1: Percentage of Laboratory Reports for 2013



## METHODS

A biweekly validation process by Maine CDC Division of Infectious Disease staff is used to validate all lab reports received by both ELR and traditional reporting methods (Figure 2).

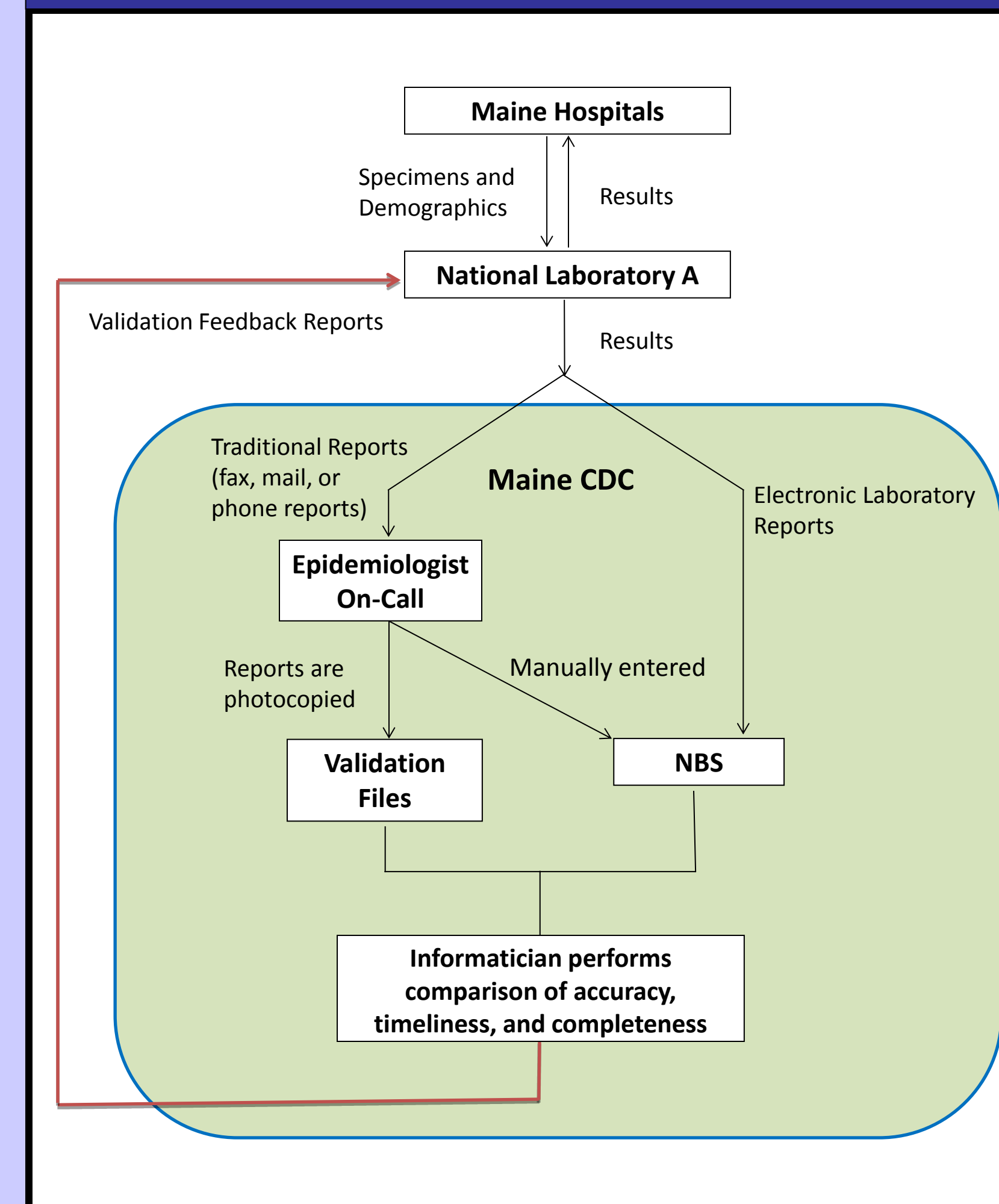
- Reports are counted to ensure that for every traditional report there is a corresponding ELR and vice versa
- 15 critical fields on each of the laboratory reports are compared to determine the completeness and accuracy of ELR

Feedback to the laboratory is communicated via two documents:

- A Summary Report which sums up the findings and issues in one easy to reference page
- A Detail Spreadsheet which documents the results from the comparison of the 15 key fields

When working with national reference laboratories, we have discovered that they rely on the ordering facilities to supply the patient demographic data. To address the issues with missing patient data, Maine CDC decided to send letters directly to the ordering facilities.

Figure 2: Laboratory Report Flow



## RESULTS

Certain data elements, such as patient address and phone, were found to be below the acceptable threshold. Letters were sent in April 2013 to the facilities in Maine which ordered tests from National Laboratory A to encourage them to send more complete data so that National Laboratory A could, in turn, have more complete reporting to Maine CDC.

Six months after the letters were sent to the ordering facilities, ELR from the laboratory was reevaluated (Figure 3). There was significant improvement in patient address data as well as a small improvement in patient phone data (Figure 4).

- Before the letters, there were months in which as few as 18% of the records had Patient Address
- After the letters, there were months as high as 98%

Figure 3: National Laboratory A ELR Timeline

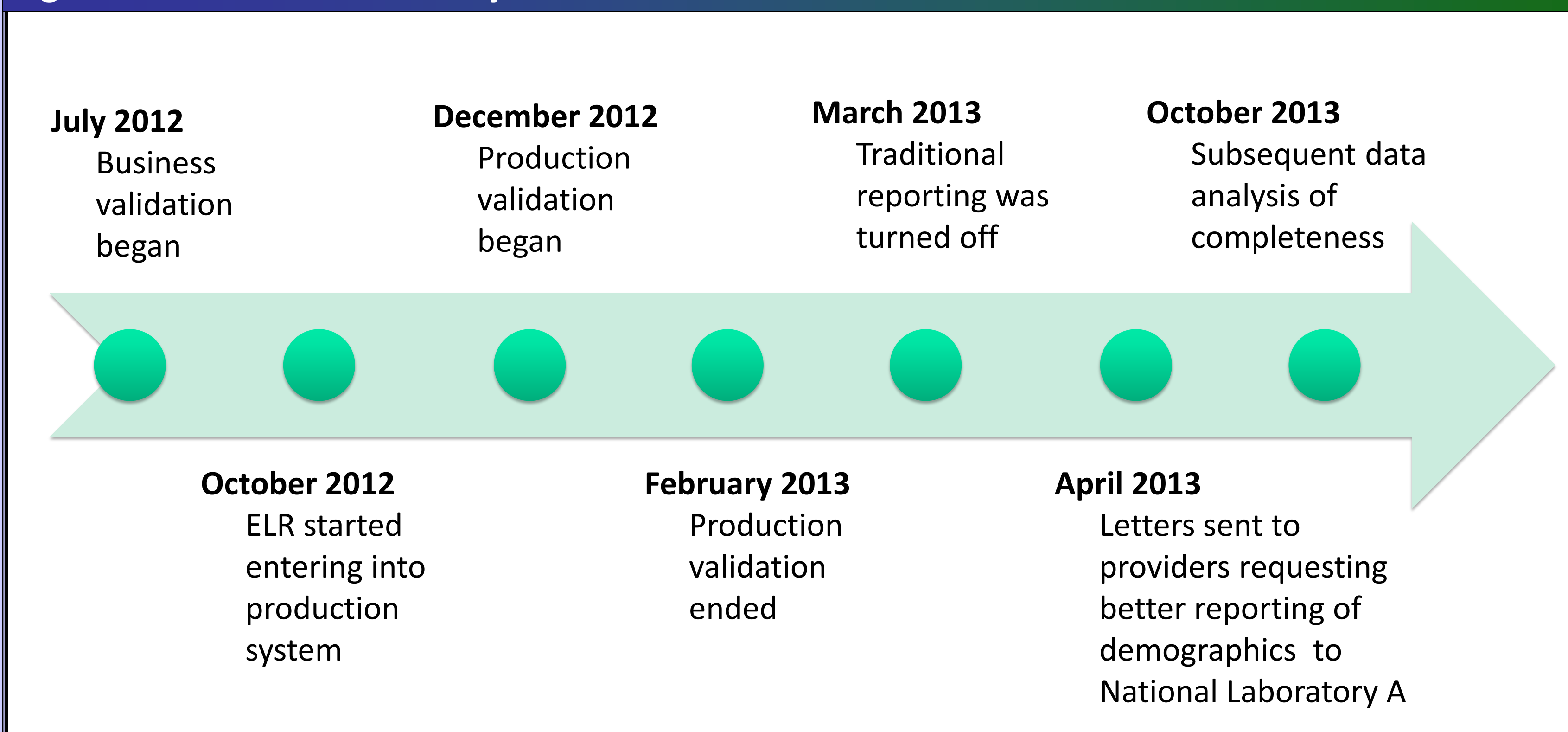
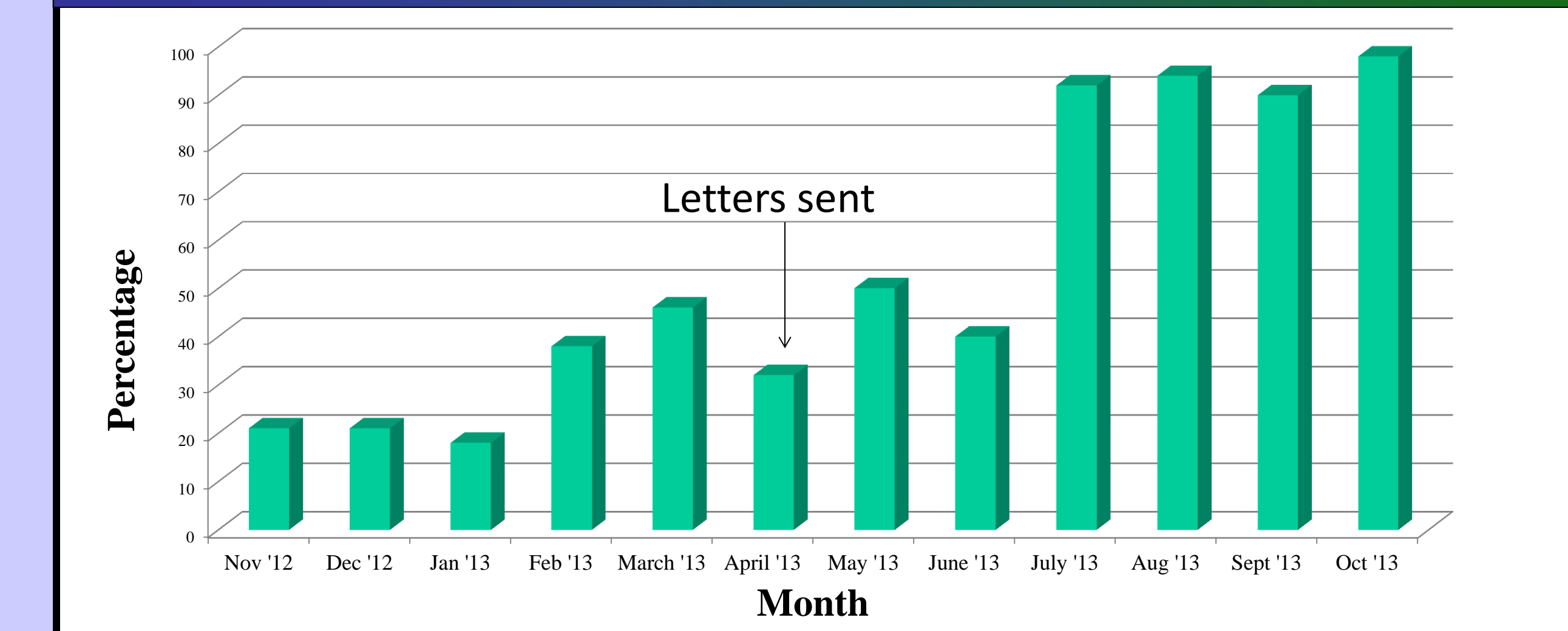


Figure 4: Percentage of ELR Containing Patient Address by Month



The data in each of the 15 critical fields was assessed and classified as:

- Accurate
- Missing the data
- Inconsistent with the data on the traditional report
- Incomplete

Table 1, from the Summary Report, shows the total of each value across a total number of 2115 fields during the period 12/3/2012 to 2/22/2013.

ELR had more data than traditional reports in 10% of all fields validated.

Timeliness was significantly improved. ELR arrived an average of 76 hours sooner than traditional reports.

Table 1: Summary of Field Comparison – ELR vs. Traditional

		Count of Fields	Percent of Total Fields
Accurate	Exact Match	1021	48%
	ELR Has More Data	211	10%
Missing Data	ELR Only	0	0%
	ELR and Traditional	883	42%
Inconsistent Data	ELR and Traditional	0	0%
Incomplete Data	ELR only	0	0%
Total Reports		2115	

## CONCLUSIONS

- ELR from National Laboratory A was successfully validated against the corresponding traditional reports for accuracy, timeliness, and completeness over a three month span. Issues with completeness were satisfactorily addressed. The accuracy and timeliness of ELR were found to be much improved over traditional reporting.
- Discontinuing the traditional reporting method improved efficiency in reporting and decreased the time spent with the processing of traditional reports.
- Sending letters to ordering facilities resulted in a significant improvement in completeness. This method of providing feedback to submitting facilities should be emulated with other laboratories whose submitters do not provide complete reporting information.
- This production validation model was found to be valuable and is currently being used for production validation efforts with other laboratories reporting electronically to Maine CDC.